

variance (ANOVA test) for analysed the comparison between three trials and groups.

Results.— Our results show that, whatever the destabilization directions (AP versus ML), the SG was always in a learning situation. Indeed, the first test is always less stable than the second and third trials. However, for CG, adaptability between the tests is only highlighted during ML imbalance. The significant differences of strategies between the groups are only visible for the AP force component.

Discussion.— In all the conditions imposed, scoliotic patients adapt specific trunk balance strategies. Clinical tests and rehabilitation methods should include the learning effect in the spatio-temporal adaptation to the ground reaction forces.

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Could posturographic parameters predict the evolution of idiopathic scoliosis?



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Keywords: Idiopathic scoliosis; Prognosis; Posturography

Introduction.— Frequency of adolescent idiopathic scoliosis (AIS) is important (2%) and prognosis of spine deformation isn't currently known at the onset of the evolution. Literature describes postural control abnormalities and the aim of the study is to determine which posturographic parameters could predict the evolution of AIS just at the onset of the evolution.

Material and methods.— In a prospective study, 75 patients with AIS (mean age: 11.6 ± 2.0 years) were clinically and radiologically assessed at the time of diagnosis and evaluated in posturography, including static tests (with and without sensory conflict using the availability or the disruption of sensory cues) and dynamic tests. Two groups were formed according to the follow-up of the AIS (progressive AIS and non-progressive AIS).

Results.— Thirty-five patients were included in non-progressive AIS group and 39 patients in the progressive AIS group. At the diagnosis visit, patients of the latter group were younger (12.25 ± 1.93 vs. 11.05 ± 1.95) and displayed higher Cobb angle (17.05 ± 5.43 vs. 12.63 ± 4.75). Patients with progressive AIS displayed higher body sways in static tests in eyes open condition, characterized by a larger sway path travelled by center of foot pressure and by higher anteroposterior oscillations. Progressive AIS patients displayed poorer balance control, mainly in the standard situation (eyes open, stable visual surround and platform), when only the somatosensory cue was disrupted (eyes open, stable visual surround and sway-referenced platform), and when visual and somatosensory cue were disrupted (eyes open, sway-referenced visual surround and platform).

Conclusion.— Posturographic parameters would be able to predict the evolution of AIS, leading to an early treatment.

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Influence of brace on spine flexibility and paravertebral muscles atrophy in scoliotic teenagers, a case-control study



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Keywords: Brace; Spine flexibility; Muscles atrophy; Teenagers

Scoliosis is a public health matter that affects 0.5 to 3% of the population. Non-surgical treatment of scoliosis consists of a proper respect of dietary and lifestyle rules, physiotherapy and brace. It is said that brace increases spinal

rigidity and causes paravertebral muscles atrophy. The aim of this study is to analyze the influence of brace on these two parameters.

This is an analytical case-control study carried out from november 2012 and march 2013 in the orthopedic and rehabilitation unit of university hospital of Bordeaux. Patients included were aged 9 to 20, with a Cobb angle $\geq 15^\circ$ without brace, they had never undergone spinal surgery. Prior to the inclusion a consent form was signed by the parents. We performed cinematic analysis of spinal mobility in flexion/extension and rotation exercises, and measured trunk muscles strength in isokineticism.

Fifty-six patients were included with an average age 14.4 ± 2.6 (33 girls, three boys). Thirteen of them presented with a thoracic curvature, 23 with thoracolumbar curvature and 19 with lumbar extension. The average maximal Cobb angle was $28.7^\circ \pm 11.4^\circ$. Thirteen patients wore brace for less than 3 months, 23 patients wore brace for a year or more. Flexion/extension mobility was reduced in lumbar spine in 69% of cases, asymmetry was noticed in right/left rotation in 91% of cases, flexor/extensor rate was greater than 1 in 80% of cases. We found a difference between brace and no brace in lumbar mobility reduction in flexion/extension (57% vs 33%) but no difference in right/left rotation asymmetry. A difference of strength was found between the two groups with flexor/extensor rate upper than 1 in 90% vs 66% of cases.

This study shows a reduction in spinal mobility and muscles strength, with differences between brace and no brace.

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Comparative radiological study of the sagittal spinal alignment of 240 adolescents with Scheuermann disease with 100 healthy teenagers



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Keywords: Spinal alignment; Pelvic parameters; Spinal parameters; Scheuermann disease

Objective.— Compare the sagittal spinal alignment of adolescents with spinal growth dystrophy (SGD) with free adolescents without spinal pathology.

Patients, materials and methods.— Two hundred and forty adolescents with SGD (vertebral wedging and/or Schmorl nodes), mean age 14.8 years.

Hundred adolescents without spinal pathology, mean age 12.2 years.

Study of the parameters of sagittal spinal alignment on a radiograph performed in standardized conditions. Measurement of lombo-pelvic parameters (morphology and positioning of the pelvis), spinal parameters, cranio-cervical parameters.

Statistical study with comparison tests average (Student), percentage (Chi 2) and correlations (Pearson). Significance if $p < 0.05$.

Results.— The mean values of cranial morphology (cranial incidence) and pelvic (pelvic incidence) were not significantly different in the two cohorts. The SGD group has higher mean values of thoracic kyphosis, lumbar and cervical lordosis ($p < 0.0001$) than the healthy group. Cervical morphology is significantly different ($p < 0.001$) in both populations, with 69% of cervical spine lordosis in the SGD population compared to the healthy population (57%). Hundred percent of healthy population is normal pelvic tilt. In the SGD cohort, 54% is paid with normal conditions, 23% with PPXS morphotype (Posterior Pelvic Crossed Syndrome), and 23% with APXS morphotype (Anterior Pelvic Crossed Syndrome). Correlations between sagittal parameters are identical in both groups. The correlation between the angular values of thoracic kyphosis and lumbar lordosis are stronger in the SGD group ($r = 0.56$, $p < 0.001$) than in the healthy group ($r = 0.36$, $p < 0.001$).

Discussion.— The occurrence of SGD lesions generates changes in type of local kyphosis associated with regional adaptations neighborhood with a call for extension and enhancement of lordosis, responsible for increased mechanical stress. The rehabilitation therapy, orthopedic and surgical must take into account both the local deformation but also of those adaptations.

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